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USER'S MANUAL

ARC120/140/160/200/300/350

DECLARATION OF CONFORMITY

I hereby declare that this machine is produced based on Chinese and international standards and is conforms to the international safety standard IEC 60947. The design and technology adopted in this machine are under a valid protection.

Please read and understand the manual carefully before the installation and operation of this machine.

The contents of this manual may be revised without prior notice and without obligation.

Although carefully checked, there may still be some inaccuracies in this manual. Please consult us if any.
The production manual is issued in July 2009.

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DECLARATION OF CONFORMITY

Hereby we declare that this machine is produced based on relative Chinese and international standards and it conforms to the international safety standard IEC794. The design and technology adopted in this machine are under patent protection.

Please read and understand this manual carefully before the installation and operation of this machine.

1. The contents of this manual may be revised without prior notice and without obligation.
2. Although carefully checked, there may still be some inaccuracies in this manual. Please consult us if any.
3. This instruction manual is issued on 1st Jan. 2009.

1. SAFETY

Welding is dangerous, and may cause damage to you and others, so take good protection when welding. For details, please refer to the operator safety guidelines in conformity with the accident prevention requirements of the manufacturer.

Professional training is needed before operating the machine.

- Use labor protection welding supplies authorized by national security supervision department.
- The operator must be special personnel with a valid "metal welding (OFC) operations" operation certificate.
- Cut off power before maintenance or repair.



Electric shock—may lead to serious injury or even death.

- Install earth device according to the application criteria.
- Never touch the live parts when skin bared or wearing wet gloves/clothes.
- Make sure that you are insulated from the ground and workpiece.
- Make sure that your working position is safe.



Smoke & gas—may be harmful to health.

- Keep the head away smoke and gas to avoid inhalation of exhaust gas from welding.
- Keep the working environment in good ventilation with exhaust or ventilation equipment when welding.



Arc radiation—may damage eyes or burn skin.

- Wear Suitable welding masks and protective clothing to protect your eyes and body.
- Use suitable masks or screens to protect spectators from harm.



Improper operation may cause fire or explosion.

- Welding sparks may result in a fire, so please make sure no combustible materials nearby and pay attention to fire safety.
- Have a fire extinguisher nearby, and have a trained person to use it.
- Airtight container welding is forbidden
- Pipe thaw with this machine is forbidden.



Hot workpiece may cause severe scalding.

- Don't contact hot workpiece with bare hands.
- Cooling is needed during continuous use of the welding torch.



Magnetic fields affect cardiac pacemaker.

- Pacemaker users should be away from the welding spot before medical consultation.



Moving parts may lead to personal injury.

- Keep yourself away from moving parts such as fan.
- All doors, panels, covers and other protective devices should be closed and in place.



Machine fault-seek professional help when encountering any difficulties.

- Consult the relevant contents of this manual if you encounter any difficulties in installation and operation.
- Contact the service center of your supplier to seek professional help if you still can not fully understand after reading the manual or still can not solve the problem



2. GENERAL DESCRIPTION

➤ **Advanced IGBT inverter technology**

- ◆ Inverter frequency is 50 KHz, greatly reducing the volume and weight of the welder.
- ◆ Great reduction in metal loss which obviously enhances the welding efficiency and energy saving effect.
- ◆ Switching frequency is beyond audio range, which almost eliminates noise pollution.

➤ **Leading control mode**

- ◆ Advanced control technology meets multi - welding technology needs and greatly improves the welding performance.
- ◆ It can be widely used in acid and alkaline electrode welding.
- ◆ Easy arc starting, less spatter, stable current and good shaping.

➤ **Features of ARC series**

- ◆ Efficiency, energy saving, portable, stable arc, high no-load voltage, and with good compensation of arc force, and be able to meet various welding requirements in aerial work, field work and fitting-out work.

➤ **Beautiful appearance and structure design**

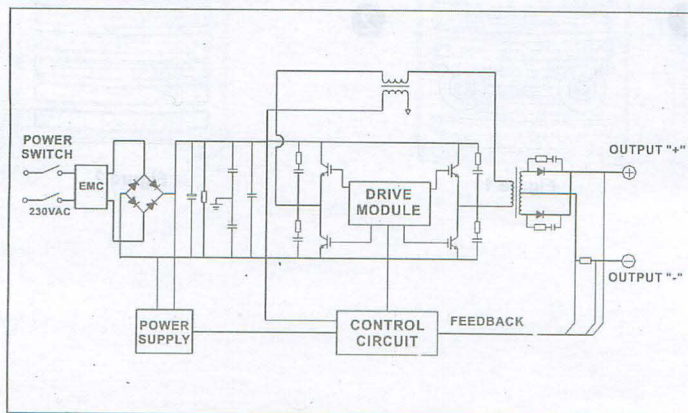
- ◆ Streamline design of the front panel and back panel makes the overall shape more attractive.

- ◆ Front panel and back panel are made of panel of high-intensity engineering plastics, which effectively ensures the high performance of the machine in severe conditions such as high impact and fall.
- ◆ With excellent insulation.
- ◆ Waterproof, dustproof, moistureproof, anti-static, anti-corrosion

3. MAIN PARAMETERS

MODEL	ARC120	ARC140	ARC160	ARC200
Rated input voltage (V)	AC230V \pm 15% 50/60Hz			
Rated input power (KVA)	5	6	7.11	8.2
Rated input current (A)	22	26	31	35
Rated output	120A/24.8V	140A/25.6V	160A/26.5V	200A/28V
Welding current range (A)	10~120A	10~140A	20~160A	20~200A
No-load voltage (V)	67	67	67	67
Rated duty cycle	25%@40 $^{\circ}$ C	30%@40 $^{\circ}$ C	30%@40 $^{\circ}$ C	30%@40 $^{\circ}$ C
Efficiency (%)	85	85	85	85
Power factor	0.93	0.93	0.93	0.93
Protection class	IP21S	IP21S	IP21S	IP21S
Insulation class	F	F	F	F
Size (mm)	268 \times 120 \times 198	290 \times 120 \times 198	290 \times 120 \times 198	302 \times 120 \times 198
Weight (Kg)	4.1	4.7	5.0	5.2

4. ELECTRIC BLOCK DIAGRAM



5. OPERATION CONTROL AND DESCRIPTION

● Front control panel (see Figure 1)

- (1) **"+" output terminal:** To connect the weld clamp.
- (2) **"-" output terminal:** To connect the earth clamp.
- (3) **Welding current knob:** To adjust the output current.
- (4) **Power LED light:** To indicate the power. Power LED light on indicates that the power switch of the machine is on.
- (5) **Overheating LED light:** To indicate overheating. Overheating LED light on indicates that the temperature inside the machine is too high and the machine is under overheating protection status.
- (6) **MMA/TIG switch:** To realize the switching between MMA and TIG.

● Back control panel (see Figure 2)

- (7) **Power input:** Power input cable.
- (8) **Power switch:** To control the power supply.
- (9) **Fan**

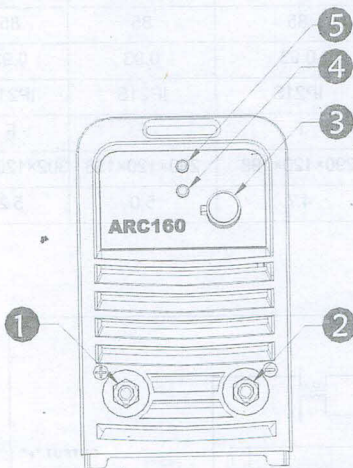


Figure 1

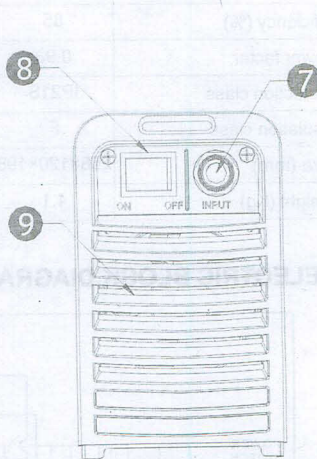


Figure 2

6. INSTALLATION DEBUGGING AND OPERATION

Note: Please install the machine strictly according to the following steps.

Turn off the power supply switch of the switch box before any electric connection operation.

The protection class of this machine is IP21S, so avoid using it in rain.

6.1 Installation method

- (1) A primary power supply cable is available for this welding machine. Connect the power supply cable with required voltage.
- (2) The primary cable should be connected to the correct socket to avoid oxidization.
- (3) Check whether the voltage value varies in the given rang with a multi-meter
- (4) Insert the cable plug with welding clamp into the "+" socket at the bottom of the front panel of the welding machine, and tighten it clockwise.
- (5) Insert the cable plug with earth clamp into the "-" socket at the bottom of the front panel of the welding machine, and tighten it clockwise.
- (6) Earth the machine well at the earth mark on the machine cabinet.

The connection as mentioned above in 6.1(4) and 6.1(5) is DC negative connection. Operator can choose DC positive connection according to workpiece metal and welding rod. Generally, DC negative connection is recommended for alkaline welding rod, while no special requirement for acid welding rod.

6.2 Operation method

- (1) After being installed according to the above method, and the power switch being switched on, the machine is started with the power LED light on and the fan working.
- (2) Pay attention to the polarity when connecting. Generally there are two modes of connection for DC welding machine available: positive connection and negative connection. Positive connection mode-connect work piece to "+", and welding clamp to "-". Negative connection mode-connect work piece to "-", and welding clamp to "+". When welding, selection according to technical requirements of the work piece. Phenomena such as unstable arc, spatter, and electrode sticking conglutination appear if improper mode is selected. Exchange the coupling plugs to change the polarity under such circs.
- (3) When switching the MMA/TIG switch to MMA mode, normal welding can be carried out under rated output current. When switching the MMA/TIG switch to TIG position and using lift arc ignition, arc can be successfully started under rated arc ignition current, and normal welding can be carried out under rated welding current.
- (4) Select lead with larger section to reduce the cable voltage drop if the distance between the work piece and the welding machine is long and the secondary cables (welding cable and earth cable) are long.
- (5) Preset the welding current according to the type and size of the welding rod, and clip the welding rod, and then welding can be carried out by short circuit arc starting. For welding parameters, please refer to 6.3.

6.3 Welding technics speed-read table (for reference only)

Welding rod dia. (mm)	Recommended welding current (A)	Recommended welding voltage (V)
1.0	20~60	20.8~22.4
1.6	44~84	21.76~23.36
2.0	60~100	22.4~24.0
2.5	80~120	23.2~24.8
3.2	108~148	23.32~24.92
4.0	140~180	24.6~27.2
5.0	180~220	27.2~28.8
6.0	220~260	28.8~30.4

Note: This table is suitable for low carbon steel welding. For other materials, consult related materials and technics manuals for reference.

7. CAUTION

1. Working Environment

- (1) Welding should be carried out in dry environment with its humidity of 90% or less.
- (2) The temperature of the working environment should be between -10 to 40.
- (3) Avoid welding in the open air unless sheltered from sunlight and rain, and never let rain or water infiltrate the machine.
- (4) Avoid welding in dusty area or environment with corrosive chemical gas.
- (5) Avoid gas shielded arc welding in environment with strong airflow.

2. Safety Tips

Over-current/over-voltage/over-heating protection circuit is installed in this machine. If the input voltage or the output current is too high or machine inside temperature over heating inside, the machine will stop automatically. However, excessive use (e.g. too high voltage) of machine may also damages machine, so please note:

2.1 Ventilation

High current passes when welding is carried out, thus natural ventilation can not satisfy the machine's cooling requirement. Maintain good ventilation of the louvers of the machine. The minimum distance between the machine and any other objects in or near the working area should be 30cm. Good ventilation is of critical importance for the normal performance and service life of the machine.

2.2 Welding operation is forbid while the machine is of overload. Remember to observe the max load current at any moment (refer to the optioned duty cycle). Make sure that the welding current should not exceed the max load current. Over-load current could obviously shorten the machine's life, or even burn the machine.

2.3 Over-voltage is forbid.

Regarding the power supply voltage range of the machine, please refer to "Main Parameters" table. This machine is of automatic voltage compensation, which enables the maintaining of the voltage range within the given range. In case that the input voltage exceeds the stipulated value, it would possibly damage the components of the machine.

2.4 An earth terminal is available for the machine. Connect it with an earth cable (section $\geq 4\text{mm}^2$) to avoid the static and electric shock.

2.5 A sudden halt may occur while the welding operation is carried out while the machine is of over-load status. Under this circumstance, it is unnecessary to restart the machine. Remain the built-in fan working to bring down the temperature inside the machine.

8. MAINTENANCE

WARNING



The following operation requires sufficient professional knowledge on electric aspect and comprehensive security knowledge. Operators should be holders of valid qualification certificates which can prove their skills and knowledge. Make sure the input cable of the machine is cut off from the electricity before uncovering the welding machine.

- (1) Check periodically whether inner circuit connection is under good condition(esp. plugs). Tighten the loose connection. If there is oxidization, remove it with sandpaper and then reconnect.
- (2) Keep hands, hair and tools away from the moving parts such as the fan to avoid personal injury or machine damage.
- (3) Clean the dust periodically with dry and clean compressed air. If welding environment with heavy smoke and pollution, the machine should be cleaned daily. The pressure of compressed air should be at a proper lever which in order to avoid the small parts inside the machine to be damaged.
- (4) Avoid rain, water and vapor infiltrate the machine. If there is, dry it and check the insulation with a megger (including that between the connections and that between the connection and the case). Only when there are no abnormal phenomena anymore, then the machine can be continually used.
- (5) Check periodically whether the insulation skin of all cables are under good condition. If there is any dilapidation, rewrap it or replace it.
- (6) Put the machine into the original packing in dry location if it is not to be used for a long time.

9. TROUBLESHOOTING

WARNING



The following operation requires sufficient professional knowledge on electric aspect and comprehensive security knowledge. Operators should be holders of valid qualification certificates which can prove their skills and knowledge. Make sure the input cable of the machine is cut off from the electricity before uncovering the welding machine.

Common Malfunction Analysis and Solution:

Malfunction Phenomena	Cause and Solution
Turn on the machine, the power LED light is off, the fan doesn't work, and no welding output.	(1) Check if the power switch is closed. (2) Check if the power supply the input cable connects is available.
Turn on the machine, the fan works, but the output current is unstable and can't be controlled by potentiometer when welding.	(1) The current potentiometer fails. Replace it. (2) Check if any loose contact exists inside the machine. If any, reconnect.
Turn on the machine, the power LED light is on, the fan works, but no welding output.	(1) Check if any loose contact exists inside the machine. (2) Open circuit or loose contact occurs at the joint of output terminal. (3) The overheating LED light is on. a) The machine is under over-heating protection status. It can recover automatically after the welding machine is cooled down. b) Check if the thermal switch is ok. Replace it if it is damaged.

Malfunction Phenomena	Cause and Solution
The welding clamp becomes very hot.	The rated current of the welding clamp is smaller than its actual working current. Replace it with a welding clamp with a bigger rated current.
Excessive spatter in MMA welding.	The output polarity connection is incorrect. Exchange the polarity.

We are still constantly improving this welder, therefore, some parts of this welder may be changed in order to achieve the better quality, but the main functions and operations will not be alternated and changed. Your understanding would be greatly appreciated.

